



Wireless World Research Forum (WWRF)

Hendrik O. Knoche, John D. McCarthy

Mobile Users' Needs and Expectations of Future Multimedia Services

Abstract—The Satellite Digital Multimedia Broadcast (SDMB) project aims to deliver multimedia services to West European mobile phone users in a cost efficient manner. To understand the service requirements for SDMB, a series of focus groups were conducted in three countries. These explored users' needs and expectations of next generation mobile multimedia services by probing seven different service types. The results illustrate different demand spectrums in different countries and give an interesting insight into the services people really want.

Index Terms— mobile phone usage, user expectations, user needs, SDMB

INTRODUCTION

THE Satellite Digital Multimedia Broadcast (SDMB) project aims to deliver multimedia services to West European mobile phone users in a cost efficient manner. The distribution of the content will be achieved by integrating satellite broadcast capacities with existing terrestrial 3G and beyond 3G infrastructures. The SDMB service assumes the use of mobile phones with extensive storage that allows the consumption of previously cached content at an opportune time. SDMB also aims to offer streaming live content as well as content that would notify users, e.g. for disaster management purposes.

The mobile phone has transcended its original role as a means of communication by serving a multitude of purposes. It has brought about new social norms and behaviours, e.g. emergent phenomena in young adults' socializing patterns. A mobile phone is not only a highly personal tool with respective implications for, e.g., fashion; rather, many aspects of being with and being

apart from others evolve around the mobile phone,

To better understand current usage and the needs, desires, and expectations of prospective users of SDMB, we conducted a series of 26 focus groups in London, UK; Toulouse, France; and Athens, Greece.

Study Methodology

Each focus group comprised between three to eight participants and lasted from 60 to 90 minutes. The focus groups were structured according to the following stages:

- Welcome and scope of the meeting
- Round-robin introduction of participants
- Questioning on current usage and satisfaction
- Questioning and discussion of proposed services.
- Summary and conclusion with a final individual survey on the proposed services.

Current Usage

The participants were encouraged to talk about their mobile phone usage. The discussion was stimulated with the following questions:

- How do you currently use your mobile?
- What do you like about it? What do you hate about it?
- Has the mobile changed your life? If so, how?
- Have you ever switched your provider and, if so, why?
- What are the imperfections or disadvantages of the mobile lifestyle?



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- How do you spend your commuting time? If you use your phone while commuting, how do you use it?
- What would you like to be able to do with your phone that you currently cannot?

Proposed Services

Following the current usage discussion we directed the participants' attention to an imaginary service that would be available in Western Europe in 2010 and would allow them to watch television-like content on their mobile phones. The situating scenario for using such a service was *dead time*, e.g. while waiting for transport or being in transit. The first two focus groups were reserved and sceptical about the feasibility of watching TV on small mobile phone screens. For that reason subsequent groups watched a sample video clip on an IPAQ (with a resolution of 240x320 pixels). Participants of these groups were more open to the idea of mobile multimedia consumption. The moderator also suggested alternative viewing options like head-mounted displays, projection techniques, and plugging into external displays. Next, the participants were asked whether they would be interested in using the following services, which were visually represented in PowerPoint slides:

1. Live events
2. News and weather
3. Disaster management
4. MTV and radio
5. PVR
6. Dating
7. Language courses

Live events

The participants were shown a picture of a soccer fan waiting at a bus station. The service was introduced as a means of following live events when the participants are not able to watch the event at home or at a pub. Watching live football matches in pubs in England is popular because games are only available on pay-TV. Once the participants had voiced their opinion about the service, they were asked for their preferred live content.

News and weather

The news and weather service was introduced with two screenshots of mobile phones, one of which showed a news anchorman and the other a weather map. The moderator described the service as non-live but said that at any given time users of the service could turn to their mobile to get a very recent news and/or weather update. It would also be possible to pause, rewind, fast forward, or skip through parts of it.

The moderator explained that the weather service would be aware of the users' location and therefore would provide regionalized information.

Participants were also asked if they would expect a choice of different news sources and if they would like to be able to access this content while visiting Western European countries.

Disaster management

The disaster management service was introduced with two graphics - one depicting a temperature map of an urban area and the other a traffic diversion map. The disaster management service would offer a push service that would alert people of disaster along with instructions what to do, places to avoid, or where, e.g., medical assistance would be available. The announcements would be initiated by some organization, agency, or the government and would only be sent to people that are in the vicinity of the disaster site.

The alert could comprise the typical notification modes of phones or possibly even turn on the phone.

Subsequently, the participants were asked what kind of events they thought would qualify as disasters.

MTV and radio

The option of an enhanced music television or radio service was presented by a picture featuring a popular rock artist and on-screen skip-forward and backward buttons.

The content could be the TOP 50 or a selection tailored to the taste of the individual customer.

The enhancements would be the option to skip and navigate the available tracks and to store them on the handset for permanent access. With the radio service users would be able to follow popular radio shows at



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opportune times other than at the original on-air time. Another probed feature was the possibility of forwarding tracks to friends.

PVR

The idea of a personal video recorder (PVR) service on the phone was suggested and explained in some detail. The service would allow for recording of favourite programmes on the handset by means of an electronic program guide. The service would also record similar shows based on previous choices. This service was represented by a screenshot of the American PVR product TiVo. The moderator suggested that user might like to use this service while being on long transits or staying in hotels abroad that have no TV content in their native language.

Dating

A dating service was illustrated by two screen grabs of web-based dating services that displayed the photos and personal details of a man and a woman. The moderator explained that users would receive profiles of other potentially compatible users. The service might also include video clips of people introducing themselves. Anticipating that participants would find this service difficult to discuss openly due to its sensitive and personal nature, the moderator asked participants whether they thought other people might be interested in it as well as whether they themselves might use it.

Language Courses

A picture of a multimedia language course product exemplified this service. The moderator described the service as a supplement to regular language courses that would help participants maintain and improve their language skills. More specifically, the service would offer lessons in audio-visual format that cover parts of weekly lectures unattended or simply provide extra practice in the language of study.

Closing questions

After explaining the proposed services, we asked the participants whether they would choose, e.g., to ride certain buses based on whether the bus company offered these services as a customer perk. Prior to bringing the sessions to a close, the moderator asked participants to rank the services from one to

seven according to their personal preferences. Rank 1 corresponded to the service that most interested them.

Participants

A total of 160 people (75 women and 85 men) participated in the study. The Greek study included both focus groups and an equivalent survey.

UK participants numbered 65 and 91% were single students from the University College London. The average age of the UK participants was 25 years and 40% were British, while the majority of non-British came from Western and Eastern Europe. All were remunerated for their time.

The 34 participants of the French focus groups were recruited from the MAESTRO partner Alcatel Space. Much older on average than the London participants (38 years), most of the French volunteers were married with children and had an engineering background.

In Greece, all participants were Greek and the majority young professionals with an average age of 33. Most were also affiliated with the MAESTRO partner Space Hellas.

Results

We will describe the responses from the complete sample and specifically point to differences between the countries. Quotes from the participants are italicised.

Answers to questions

Current Usage

Typical usage comprises voice conversation and short messaging. The most popular 'non-traditional' uses are gaming, listening to radio, multimedia messaging and Internet access. Despite their labour intensiveness, which is a deterrent to some, text messages are valued for their comparably low cost, efficiency, (*"I don't want to talk for hours"*), and the ability to conduct several conversations simultaneously. It is also a resort when excessive noise or etiquette inhibits voice communication. Furthermore, as long as storage permits, text messaging is persistent, in contrast to ephemeral conversations. In spite of this popularity many participants voice their disappointment with current SMS push services. Untimely messages, duplicates, too many non-

meaningful messages and the cost are common complaints.

UK participants consider having a mobile phone obligatory and peers who do not have one annoy many of them. For them usage does not necessarily imply being on the move – many either no longer have or have never had a landline phone after they had left home. Staying in touch with their social network is their prime concern.

Ubiquitous availability is challenged primarily by cost, imperfect coverage, “*Bad reception defeats the point of a mobile*”, short battery life, and losing the phone.

Seventy percent of UK participants have pay-as-you-go (non-contract) phones. Many chose their provider according to their social circle’s preferences in order to control and minimise costs.

The majority of Greek participants, in contrast, had mobile phone contracts (65%).

Many of the French participants had mobile phones as part of their job and supplemented these with private pay-as-you-go phones.

Changes in life style

In general the younger UK participants are not as conscious of a change in their lifestyles due to mobile phones. They consider having a mobile part of daily life.

For the Greek participants the ease of mobile communication comes at the price of leading a life in which one is dependent on mobile phones, more anxious, and lacking time for face-to-face communication.

The French especially value the peace of mind of having the option to call anybody at anytime from everywhere.

Advantages and disadvantages

This section compiles replies from the two questions about what people like/hate about their mobiles and what they regard as the imperfections of the mobile lifestyle.

According to participants, the main advantages of mobile phones are easy, immediate communication from any location (including abroad), especially during emergencies, and the ability to locate people when attempting to meet. Some also mentioned that having a mobile phone bolsters their self-confidence because they have an instant mode of communication at their fingertips at all times.

In general the main disadvantage voiced about mobile telephony was cost. Short

battery life and unsatisfactory coverage were also major complaints. Furthermore, the participants were worried about the security, i.e. privacy, of mobile communication.

Apart from battery life, the most common complaint about the handsets was the small screen size. However, women especially dislike bulky phones that might take up too much space in their purses.

Moreover, participants in the UK and France were annoyed about the lack of mobile phone usage etiquette in public spaces.

In Greece the major worry connected with mobile phones is radiation. Recent public debates about mobile phone radiation and legislation about placement of antenna masts near ‘sensitive areas’ illustrate Greek participants’ sensitivity to this negative side-effect of mobile telephony.

Mobile providers switched

The major reason for switching providers is cost. Better service was also mentioned. Not being able to, or the hassle involved in taking your number with you to the new provider, was and still is a major deterrent for a switch voiced by French participants.

Usage on public transport

The majority of the participants using public transport were in the UK group from London. In general most participants use their phones on public transport when possible (for example the London underground does not provide coverage). The use consists of regular calls, text messaging, gaming and some listen to an integrated radio. Many of the participants said they try to avoid making voice calls on public and are annoyed about others doing so.

The majority of Greek public transport users do not use their phones during those times (53%).

Wishes

There is a huge range of desires. Some of these are already realized in available handsets and services. However, many of them have not reached the average customer due to high prices and/or service bundling (e.g. location based services).

Better and cheaper Internet service on the phone was among the most sought after, e.g. “*If I could have Google on my phone*”. The French participants were looking for better

integration with other modes of communication, especially email.

Being able to make payments with appropriate security was a popular request in Greece.

More storage space was a typical request from the UK participants who attribute a very high value to stored content on their handsets, such as private SMS and contact information. They also stated an interest in backing up this information, e.g. centrally with the provider. Another way of achieving this was also desired: interconnection to/from their computer.

Music - be it through radio or mp3 playing capability - were also desired by the UK participants.

Feedback on mobile multimedia services

First of all we will elaborate on the participants' general attitude of consuming "television like" content on their phones.

Their main worry again was that consumption of the content would be very expensive. Since they have other choices that are inexpensive (paid for or free newspapers) and often available in dead time situations, they are not willing to pay current multimedia content prices. They also expressed doubts that the screen size would be big enough to enjoy TV content and that they might miss parts (subtle cues) of the content. On the other hand their second biggest worry was that the size and the weight of the handset might be increased beyond their preferential limit. Especially women, do not want to trade off this gain in visual quality with larger and possibly heavier mobile phones.

Few actually voiced the concern about interference but participants agreed that if this form of entertainment would interfere in any way with their communication needs - be it through high cost or hard cost control, reduction in battery life or having to worry about running out of battery if watching the content on the phone, user interface design (incoming call are not noticeable enough) they would be hesitant to make any use of it. The participants also feared that consuming bi-modal information might distract them and e.g. make them miss their stops etc. This

was also another driver for short content that would not require much attention or can be consumed only aurally if necessary. Many participants also favoured an obligatory usage of headsets.

However, listening to music or the radio while on the move is highly valued and would require neither visual attention nor a significantly larger phone.

Proposed Services

We will now discuss the replies to the proposed services in more detail. We estimated the popularity by compiling all participants' top 3 choices depicted in Fig. 1 split up by country. The services are ordered in descending order from left to right based on the percentage of participants that had ranked a service in their top 3.

The most popular content is news with disaster management as a close second. Interest in live and music services range in the middle and language courses, PVR and dating are the least popular.

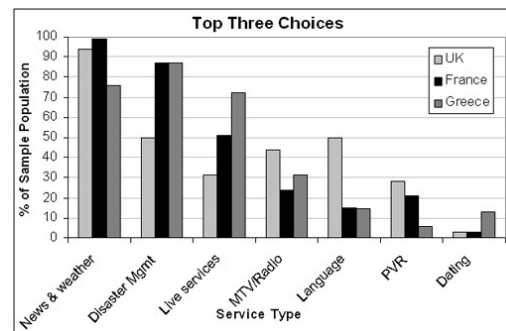


Fig. 1: The top 3 choices of services of the three countries compared

Complete ranking results

Fig. 2 depicts all the percentages for the ranks of a service across the participants from all countries.

It summarises the ratings from 33 participants from France, 35 from the UK, and 55 from Greece. Participants did not always rank all services due to a lack of interest in some of them. In Fig. 2 these scores are marked as n/r.

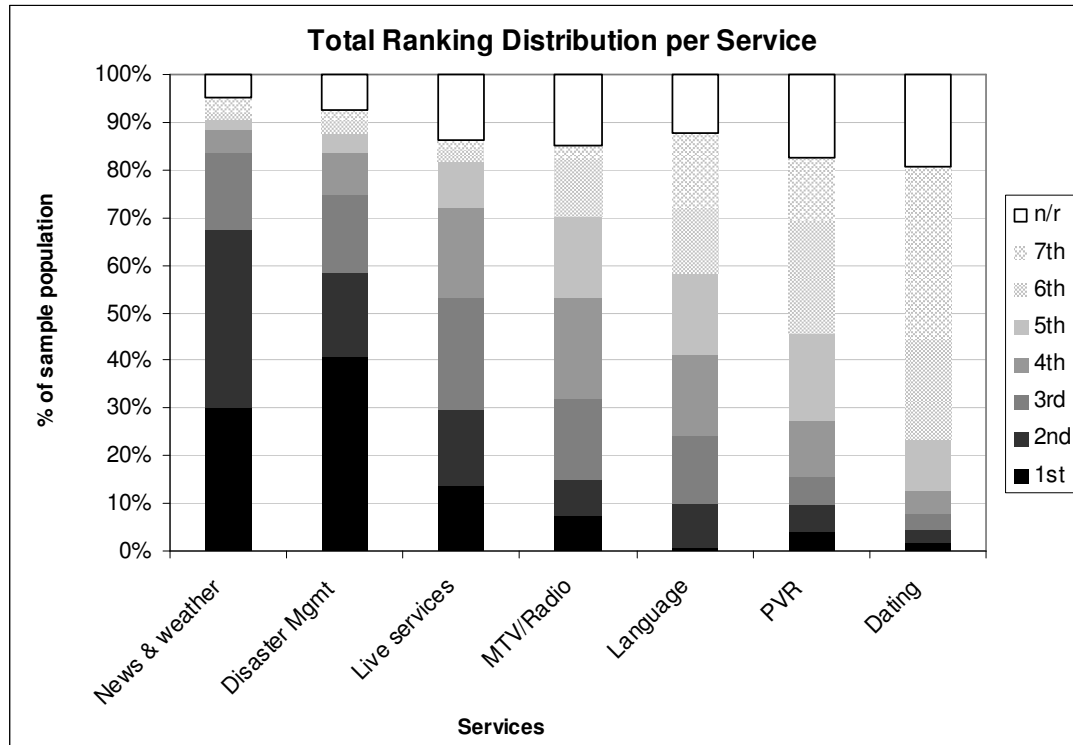


Fig. 2. Ranking distribution of all content types

News and weather

Participants are most interested in news content overall. Its timeliness, brevity and piecemeal-like character matches well with envisioned dead time usage, e.g. while commuting or waiting, and the desire to be up-to-date (“...when you hear about the bombings you want to know right away what’s going on”).

The vast majority assumed that they would have a choice of several news providers. The benefit of having access to home news while abroad was also very attractive.

The participants also expressed great interest in traffic news.

Weather is not as popular as news. A separate study conducted within the MAESTRO project in the UK had probed 20 participants with similar content types but news and weather were separate choices. In that study news was again leading the field with 85% of the participants being interested. But the weather content had appealed only to 20% of the participants [1].

Despite the huge popularity of this content type many participants mentioned that if the

price was too high they had plenty of other news sources to choose from or could wait until they could have a free update on some other medium.

Disaster management

The localised warning system used as a means to coordinate people around or away from disaster areas is also highly valued.

For the Greek participants, this was the most appealing service (56% had this as their first choice).

The higher sensitivity of the Greek and French participants to security, which can be seen in Fig. 1, can be traced back to multiple reasons. First of all, both Athens and Toulouse have had recent experiences of disasters. Greece in general is a country of high seismic activities with frequent occurrences of floods and fires. Toulouse had a recent explosion of a chemical plant with many casualties and thousands injured.

Second, the participants in France and Greece were on average much older and the majority of them had children.

The participants also showed a very high interest in being notified about traffic

problems (*"I won't get messages about disasters all the time, so in the mean time traffic info would be helpful"*).

The participants became aware and expressed unease about the fact that such a service would require mobile networks with knowledge about their location and movements (*"they know where you are"*).

However, the participants are not only worried about being under surveillance but also about who would be authorized to send warnings and whether the system could be hijacked or jammed. Another concern is the frequency of alerts with its negative side effects: desensitisation and anxiety.

Usually a debate evolved around the question as to what would qualify as a disaster. There is a big grey zone and people were concerned about receiving too many messages about incidents, which do not constitute a disaster or potential threat to them, e.g., *"light fog on the roads [in England]"*.

Many participants said that from a moral and democratic standpoint charging for the disaster management service was inappropriate (*"it can't be that certain people can't afford it"*). Some participants pointed out that in some cases governments have already used text messaging to inform their people in case of extraordinary circumstances, for example in Italy during a major black out period.

Live

More than 50% of the participants ranked live content as one of their top three choices.

Remarkably, the most popular content that participants would like to follow live is news. We assume that this is more an expression of an immediate desire for news than the participants' willingness to wait for live TV news updates at predefined times.

Sports content followed suit with football leading the field. The following sports types depended much on the country (e.g. basketball is very popular in Greece). Far less sought than the former two, were weather, stock quotes, concerts, and regular television channels with movies, soaps, and shows.

For many participants watching television constitutes a background or a social activity. The latter is especially true for live content and participants expressed they would rather experience live content in a group. Taken

together with the fact that people generally do not have a tendency of sharing their phone, this service is considered as a back up for unfortunate circumstances. Because of this many prefer pay-per-view as the method of payment for this service. Participants were especially wary of the cost of this service (*"I think that would be good – but if it's too expensive then I wouldn't use it"*) and the inappropriate screen size for a live experience of a sports event.

Music television or radio

Many participants expressed more interest in being able to follow regular radio live on their phone than full fledged music television (*"I would be quite happy with radio – I can switch between my favourite channels – I like listening more than watching"*) but nevertheless more than 30% ranked music services on their mobile phones in their top 3 ranks.

The desire of UK participants was that content obtained through a service like this could be transferred to and from computers and that forwarding a song to a friend would not be prohibited. Converging mp3 players, with plenty of storage space, with the mobile phone, if battery life would not be compromised also intrigued them.

Language courses

Many of the focus group participants, especially non-native English speakers, found this service appealing, despite scepticism that they would want to expose themselves to demanding content while on the move. Discussions on this topic sparked ideas about having access to mobile dictionaries and audible translation services for words.

Rather than using the service only to make up for missed language classes, participants expressed the desire to use the service as a general supplement to any lecture, or for cooking programmes or how-to material suitable for repeated viewings.

This service drew the biggest interest in the UK where our sample consisted mostly of students, many of whom were foreign. In a diverse population like London's, the appeal of a service promoting or assisting the study of foreign languages is not surprising.



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PVR

The personal video recorder service is most appealing to participants who have extensive commutes. People with shorter commutes were not as interested in following content with long storylines (*"anything longer than 10 minutes - I don't think people would do it outside of home"*).

Many participants like the idea of having a mobile remote control for their home television set and a portable TV guide.

In this context people are worried about a complex user interface, especially on a small screen.

Dating

The service that allows users to browse through multimedia files of prospective partners drew the weakest response, despite participants' claims that they knew many who would be interested in it. *"I wouldn't do it but I know a lot of people who would – a lot of people would do anything to meet other people"*. One of the anticipated problems of using such a service was a loss of face. *"What kind of person are you if you're dating on the tube [London underground]? Everyone would see that you're looking for someone"*. Some of the participants who liked the idea of browsing through personal profile information were also interested in an additional chat facility.

Many of the UK participants asserted that their parents would consider this service easier to control and therefore safer than equivalent services on computers where access is almost impossible to control.

Conclusion

Although participants generally like the idea of consuming multimedia content on their phone, it seems that, for many, watching television on the phone is like learning to walk before you crawl – they are more critical of the fact that coverage for standard calls falls short of expectations.

Overall, the participants were interested in following content that would be comparably short. This matches findings of a study conducted in Finland [2] where participants were usually using mobile television services for less than 10 minutes.

In terms of services news is wanted more than anything else. News fits with the concept of mobility because of its brevity,

appeal to peoples' desire of being up-to-date, and its relevance to being mobile in the form of traffic news.

Live sports are not as appealing to people as one might expect because of the different social form in which people prefer to experience it. Music and radio services are popular options especially among the younger participants.

Mobile consumption of multimedia content has to be inexpensive as people are already wary of the cost of their mobile communication and must not interfere with people's communication needs and patterns in order to be a success.

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